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# Baltimore Medical College

## ALUMNI JOURNAL.

Vol. III.

BALTIMORE, AUGUST 1st, 1900.

No. 1.

### Treatment of Tetanus with Anti-Tetanus Serum.\*

BY J. D. BLAKE, M. D.

Professor of Clinical and Operative Surgery,  
Baltimore Medical College.

*Mr. Chairman and Gentlemen*—The object of this paper is neither to announce a new discovery nor to advance a new theory concerning an old one, but simply to emphasize some points connected with the use of anti-tetanus serum in the treatment of tetanus.

Much has been written for and against serum therapy in the treatment of disease, but the conviction seems to remain with a very large and growing class of practitioners that it is to this method of treatment that we are to look for results in the future in dealing with this most distressing and fatal disease.

Certainly, it was the unsatisfactory results of the older method of treatment that caused Behring and Kitasata to resort to the injection of blood-serum obtained from animals, which had been rendered proof against the disease, into other animals suffering with it, and Baginsky, acting upon the results of these experiments, was the first to make them on the human subject; his subject being a child suffering with tetanus neonatorum. This patient was given 0.1 grm. daily for three (3) days. In each instance the reaction was marked, and while, for a time, there was apparent improvement, the tetanic spasms returned to their previous degree of violence, and the little patient died.

Dr. Baginsky was inclined to the opinion that he had been too cautious and had failed to give him enough of the antidote and that better results would have followed had he pushed the treatment a little more, and just here lies the failure in many cases, in my opinion. Seeing the cases early and the free use of the serum are the two essential factors in the successful treatment of tetanus.

*January 17, 1900.*—R. J. A., age 40, married, occupation superintendent; had three of his fingers on his left hand so badly crushed in a street car accident that it was necessary to amputate them. This was done under very poor antiseptic conditions. *January 24, 6 P. M.*, or seven days after the reception of his injury, he was brought to the Maryland General Hospital and placed under my care on account of the development of tetanus. His condition, at the time of entry, was as follows:

Finger stumps sloughing and painful, a mild cellulitis involving the hand, jaws locked. There was more or less general fixity of the muscles of the neck and back while tetanic spasm occurred on movement or touch; the skin was hyperesthetic; swallowing was difficult and attended, at times, with regurgitation and strangulation. His attending physician reported that this condition first began to make its appearance on the 22nd, early in the morning, or four days after the receipt of the injury. Temperature on entrance, 101.8; pulse, 114; respiration, 26 and jerking; intellect, perfectly clear.

*Treatment.*—Notwithstanding the fact that he had a free stool prior to entrance, an

\*Read before American Medical Association.

## BALTIMORE MEDICAL COLLEGE

enema was given to wash out lower bowel, and, as he had not slept for 24 hours, a hypodermic injection of morphia  $\frac{1}{4}$  gr. and atropia  $\frac{1}{100}$  gr. was given. An hour later he was given 10 cc. of anti-tetanus serum, his room kept quiet and dark.

He having several teeth out, liquid food and medicine could be introduced into his mouth. He was given milk and water to quench his thirst, which was annoying.

His hand was immersed in hot bichloride solution 1-10,000 for half an hour. All the stitches in the flaps were removed. After this the hand was kept wrapped in towels wrung out of hot bichloride solution and covered with oil silk.

At 10 P. M. he was given 10 cc. more of anti-tetanus serum.

*January 20th.*—Patient was restless through the night, but slept some; complained of pain in hand and arm. 6 A. M.—Temperature, 101.2; pulse, 104; respiration, 22. Another 10 cc. was given. Condition of jaws and muscles generally much the same as yesterday morning. About two ounces of beef tea is swallowed with difficulty; this amount, alternating with milk, is given every two hours. Chloral hydrate gr. 5 and 10 drops of tincture of cannabis indica are given every four hours.

10 A. M.—10 cc. serum. Temperature, 100.4; pulse, 98; respiration, 22.

2 P. M.—Temperature, pulse and respiration about the same.

6 P. M.—Seems easier. 10 cc. serum given. Temperature, 99.8; pulse, 96; respiration, 20.  $\frac{1}{2}$  gr. calomel is given every half hour until six grains are given. Two hours after the last dose there was a movement of the bowels.

10 P. M.—Patient is sleeping.

10.30 P. M.—Is given nourishment, and says he feels better. Muscles still in contraction. From this time until February 1st temperature ranged from 99.4 to 98.5. Pulse

ranged from 96 to 90. Respiration from 24 to 20, after which the recovery was uneventful.

*Amount of serum given, 50 cc.*

CASE No. 2.—F. W., aged 16, schoolboy; was brought into the hospital March 19, 1900, about 10 A. M., with the following history:

Five days prior to his entry, while amusing himself by climbing a fence, he ran a splinter into his right thigh, the splinter imbedding itself several inches in the thigh. The splinter was removed by his family physician, and all seemed to go right until November 18, when he developed symptoms of tetanus. On examination, we found him suffering with tetanic spasm, his jaws being firmly fixed and swallowing very difficult. His temperature at that time was 99.6; pulse, 104; respiration, 28. The wound showed a comparatively healthy condition. A small quantity of sanguous pus could be made to ooze from the wound by slight pressure over the track of the wound. He was taken to the operating room, where the wound was thoroughly opened up under anaesthesia, curetted, and washed with an antiseptic solution, after which it was packed with iodoform gauze and the patient placed in a dark and quiet room and given 10 cc. of anti-tetanus serum; in addition to this, as he had had no sleep for hours, he was given  $\frac{1}{4}$  gr. of morphia hypodermically.

2 P. M.—Temperature, 100; pulse, 108; respiration, 24. Has had about an hour's sleep. At times teeth can be separated sufficiently to introduce liquids. Water, beef tea and milk are given at short intervals in small quantities. An enema was given which was very effective. 10 cc. of serum was given.

6 P. M.—Temperature, 99.2; pulse, 100; respiration, 24. Marked tendency to opisthotonus. Slightest movement of bed or bed clothing cause spasmodic contraction

in back and neck. Body bathed in profuse perspiration. A mixture containing 5 gr. each of bromide of potassium and chloral hydrate, with 5 drops of tincture of *cannabis indica*, is ordered to be given him every four hours, which had the effect of producing sleep at intervals.

12 P. M.—Condition of patient about the same.

*March 21st, 6 A. M.*—Temperature, 99.6; pulse, 100; respiration, 24. Patient feels somewhat better, although he complains very much with pain in neck and along spinal column. Muscles of abdomen and limbs very rigid. 10 cc. of anti-tetanus serum administered.

10 A. M.—Patient has had one hour's sleep. Still complains very much of the pains in his neck and back. Spinal muscles very rigid; tendency to opisthotonus somewhat increased. Has had two stools during the morning—the result of frequent administration of solution of sulphate of magnesia.

2 P. M.—Patient is sleeping.

3 P. M.—Says he feels somewhat better; is able to take a little chicken broth and cold water; swallowing is difficult, often attended with severe coughing and threatening strangulation.

6 P. M.—Patient's condition unchanged.

12 P. M.—Feels better, but complains a great deal of pains in back and neck; has slept very little.

*March 22, 6 P. M.*—Patient complains of pains to such an extent that  $\frac{1}{4}$  gr. morphia is administered hypodermically. 10 cc. anti-tetanus serum is also given. Muscles of abdomen very rigid. Very little nourishment can be taken at this time. An enema of warm salt solution is given and retained.

12 M.—Patient has slept some; thirst very much abated; feels better; liquid nourishment continued as opportunity permits.

6 P. M.—10 cc. serum; liquid nourishment is given; muscles of jaw show a slight

inclination to relax; swallowing somewhat easier.

12 P. M.—Condition of patient unchanged.

*March 23, 6 A. M.*—There appeared upon the lower extremities a mottled eruption not unlike purpura hemorrhagica, which disappeared after several days without special significance.

6 P. M.—Feeling somewhat better. 10 cc. serum administered; nourishment.

From this date the patient gradually improved until he was discharged, April 4th, 1900.

*Amount of serum given, 60 cc.*

CASE NO. 3.—Thomas B., aged 26, married, machinist. On June 20th, 1899, while at work, had his foot penetrated by a nail, which was treated lightly at first. On the 25th he had a chill, which was followed by fever. At the same time he observed that his jaws became more or less fixed and could open them only with difficulty. His family physician prescribed some simple remedy, and on examination of the foot found a slight tenderness over the wound, which had healed. On the 26th I was asked to see him and found his jaws were becoming more and more fixed and could be opened one-half the natural width. The muscles of the neck were becoming involved. An anæsthetic was administered and the wound of the foot opened thoroughly and all tissue in the immediate neighborhood removed. At this time his temperature was 101.2; pulse, 108; respiration, 24.

4 P. M.—Temperature, 102.2, which was due to reaction; pulse, 108; respiration, 24.

8 P. M.—Temperature, 100; pulse, 108; respiration, 24. Stiffness in the jaws and neck has increased. Teeth can be separated to the extent that will permit the point of a spoon; swallowing more difficult. Patient is very restless.  $\frac{1}{4}$  gr. morphia and atropia  $\frac{1}{100}$  is administered; 5 gr. each of bromide of potassium and chloral hydrate, and 10 drops

of tincture of cannabis indica ordered to be given every three hours. In addition to this, 10 cc. anti-tetanus serum is given.

June 27, 6 A. M.—Patient rested poorly through the night; was restless, with great tendency to spasmodic contraction upon slightest movement of bed or bed clothes; kept his head buried in pillow; complains greatly of pain in neck; swallowing somewhat improved. Temperature, 100; pulse, 104; respiration, 20. Was given milk and beef tea, which he swallowed slowly and with difficulty. Enema was given and was very effectual. Bromide and chloral mixture continued.

12 M.—Has slept some during forenoon and says he feels better. 10 cc. serum administered.

6 P. M.—Temperature, 101.2; pulse, 104; respiration, 20. Muscular rigidity more marked. Complains of severe pain in neck and abdomen, abdominal muscles being very rigid. Bromide and chloral mixture continued; took milk.

12 P. M.—Temperature, 101.6; pulse, 102; respiration, 20. 10 cc. serum given.

June 28th, 6 A. M.—Slept at intervals through the night. Tetanic spasms frequent, but not so severe; otherwise about the same.

12 M.—Temperature, 100.4; pulse, 100; respiration, 19. Nourishment and 10 cc. serum given.

6 P. M.—Condition unchanged.

12 P. M.—Condition unchanged.

June 29, 6 A. M.—Condition somewhat easier. Temperature, 100; pulse, 102; respiration, 20. 10 cc. serum given.

12 M.—Condition somewhat better.

6 P. M.—Condition about same.

June 30.—From this date the symptoms gradually improved until July 28, when he was discharged.

*Amount of serum used; 60 cc.*

CASE No. 5.—W. R. J., aged 28, single, colored, farm hand.

*September 5, 1898.*—While bathing in the Patapsco, jumped from a plank, and one of his feet came in contact with the stump of a decomposing post at the bottom of the river. His foot was penetrated and considerably lacerated. He went ashore after the accident, and assisted by some friends removed several fragments of rotten wood from the wounded foot, after which he was taken to his home, when the wound was dressed by the application of cloths wrung out of hot water and poultices.

Upon the morning of the twelfth day after the accident he noticed that the muscles of his jaws were painful and that in his efforts to swallow, his jaws would close involuntarily. His family physician having been called at this time, diagnosed his trouble, and sent him to the hospital.

Examination at the hospital revealed the fact that the wound in the foot had almost entirely healed, but gave evidence of some foreign material still imbedded in the tissues near the heel. His jaws were rigid, and swallowing was interrupted by spasmodic muscular contraction.

He was immediately anaesthetized and an incision made over the site of the wound, disclosing a large splinter of rotten wood imbedded within. This was removed, and the tissues in the immediate vicinity were also excised, after which the wound was packed with iodoform gauze and left wide open and dressed by being kept wrapped with towels wrung out of hot bichloride solution (1 to 10,000).  $\frac{1}{4}$  gr. morphia and  $\frac{1}{150}$  of atropia were given hypodermically and the patient placed in bed in a dark and quiet room. His temperature at this time was 100.2; pulse, 114; respiration, 22. He was given an ounce of castor oil, which he succeeded in swallowing after some difficulty.

12 P. M.—About the same as in the afternoon. 10 cc. anti-tetanus serum were administered at this time.

September 6, 6 A. M.—Patient had copious action during the night. Slept but little; was restless and very thirsty; jaws more firmly locked; marked opisthotonus; severe spasmodic contractions of the diaphragm. Hypodermic injection of morphia and atropia is given, and in addition to this 10 gr. each of bromide of potassium and chloral hydrate are ordered to be given every four hours.

6 P. M.—Patient has had a very restless day. Temperature, 103; opisthotonus marked; very severe pains in the neck and back, and is subjected to violent muscular jerking upon the slightest irritation, such as movement of the bed clothes or bed.

12 P. M.—Patient about the same. Temperature, 100.1; pulse, 114; respiration, 24.

September 7, 6 A. M.—Patient has had a fair night, except at times, when the tetanic spasms attacked him, which seem to be more frequent. 10 cc. of anti-tetanus serum were given. From this time the spasms varied slightly, but continued in severity until September 13, when he died.

*Amount of serum given, 70 cc.*

CASE No. 5.—M. T., aged 33, white, married, carpenter; was brought into the hospital November 10, 1898. Had his foot penetrated by a nail, which, he said, was pointing upwards in some old boards in a building upon which he was engaged nine days before. The wound in his foot had completely healed, and he had been going about several days before the development of the tetanus.

On the morning of the 9th he had a slight chill, which was followed by some fever, and on the morning of the 10th he observed that he was unable to open his mouth as wide as usual. The family physician being called, diagnosed his case and brought him

to the hospital. Upon examination the scar of the wound made by the nail was quite evident, but firmly healed. He was anesthetized and the scar with adjacent tissues removed. The wound was left open and dressed antiseptically by cloths wrung out of hot bichloride solution. Temperature, 98.9; pulse, 100; respiration, 20. After being placed in bed, 10 cc. anti-tetanus serum was given. This was repeated three times daily for two days. His swallowing became more and more difficult and jaws became more decidedly fixed. Spasmodic contraction of back and neck became more severe until it was with extreme difficulty that he could swallow at all or that fluids could be gotten between his teeth. Rectal enemas were given of beef tea, salt solution and peptonized milk, which was kept up for five days, after which his symptoms began to subside and he to improve until he was discharged on December 26, well.

*Amount of serum given, 70 cc.*

#### Sporadic Cretinism.\*

BY NOBLE P. BARNES, M. D. ('93.)

Professor of Pediatrics, Medical Department, National University. Pediatrician, Casualty Hospital and Eastern Dispensary.

Probably few subjects received more marked attention, and terminated in more brilliant results, than that bestowed upon myxedematous conditions during the latter years of the nineteenth century. While the subject of cretinism is not a new one to many professional leaders in America, England, Germany and Sweden, and has become familiar to most physicians through the later writings of Horsley, Beadles, McGraw and Osler,—yet the subject has never been presented to this Society, nor have any cases, to my knowledge, been reported as occurring

\*Read at the January meeting of the Washington Medical and Surgical Society.

within the limits of the District of Columbia. Fortunate enough to have three cases now under observation, I ask your indulgence in presenting a subject upon which much has been written within the past ten years.

Owing to the prevalence of goitre in certain districts of this country, in the first half of the nineteenth century, and the association of goitre and endemic cretinism, many writers were led to believe that cretinism was endemic in certain parts of the United States, notably the mountainous region of Southern California and the valleys of Vermont and Massachusetts. The condition was supposed to be common in valleys and gorges where it was necessary for the people to drink snow and ice water that had run off of calcareous deposits; surrounded, as they were, with impure air and lack of sunlight in the rudely constructed huts, living on a meagre diet—in extreme poverty—and unsanitary conditions. Whatever effect these exposed conditions may have had upon the earlier settlers, it is a noteworthy fact that with improved conditions, goitrous subjects are becoming fewer, and we can now safely say that there is no endemic cretinism in the United States today, although the cases of sporadic cretinism are not so rare as was commonly supposed ten years ago. In 1893 Dr. Osler reported eleven cases collected in the United States and Canada, while in 1897 he succeeded in raising the number to sixty. This was due to agitation of the subject brought about by the advent of thyroid therapy and a greater familiarity with the subject by the general practitioner; no doubt four more years will double the number.

All advancement in medical science is most fascinatingly interesting, and the progress in the pathology and treatment of cretinism is not an exception to the rule.

Myxedematous conditions of the adult

were receiving the best efforts of the profession for fully one hundred years.

In 1800 Dr. Barton of the University of Pennsylvania published his "Memoir Concerning the Goitre As It Prevails in Different Parts of North America." He stated that "cretinism is undoubtedly very rare in North America," and did not believe that goitre and idiotism are necessarily connected or associated with each other.

Patterson suggested that cretinism was a disease analogous to, if not identical with, adult myxedema; that in both there was either an absence or deficient action of the thyroid gland.

In 1850 Curling drew attention to the fact that in cretins the gland was either absent or diseased.

Dr. Hilton Fagge, in 1871, applied the name of sporadic cretinism to myxedema of infants and children, describing them as imbecile dwarfs.

Bourneville applied the terms "Idiopathic Myxoedema." Other terms, as "Cretinoid Idiocy," and "Idiocy with Pachydermatous Cachexia," have also been applied.

The subject received fresh life in 1873, when Sir William Gull read before the Clinical Society of London his paper, entitled "A Cretinoid State Supervening in Adult Life in Woman," and a second paper in 1878 on "Cretinoid Change."

This resulted in the appointment of a special committee on this subject chairmaned by Dr. Ord, who, in 1888, reported 109 cases of myxedema, and concluded the report of the committee as follows: "That there is a strong evidence that myxoedema, sporadic cretinism, endemic cretinism, cachexia stuporosa and the operative myxoedema of animals are severally, species of one genus."

Reverdin and Kocher made observations relating to the cachexia following total extirpation of the thyroid gland, and Horsley,

among other suggestions, demonstrated an experimental myxœdema.

Thus physicians, pathologists and surgeons united in their efforts to clear one of the darkest pathological problems and benefit one of the most hopeless human disorders.

There is really no essential difference between endemic and sporadic cretinism. In the endemic form the gland is commonly enlarged, and there is a marked hereditary influence; goitrous parents producing cretinous children.

In the sporadic cases the gland is usually absent or atrophied.

The varying grades of cretinism depend upon, first, a congenital absence of the thyroid gland, producing congenital cretinism, which is rare and short-lived. Second, upon the atrophy, destruction or loss of function of the gland, at or after birth. The subject developing in infancy or early childhood, and these form the majority of the sporadic cases.

The earlier the function of the gland is lost, the more pronounced the change, even to producing deaf-mute idiots, marked skeletal deformity, muscular paralysis, and mental depravity.

A typical cretin or a marked cretinoid degeneration is a picture easily remembered—a characteristic vicious conformation of the body and an arrest and defective development of both body and brain.

The anatomical characteristics most prominent are the stunted, stubby stature, the cretin rarely over four feet long; the absence, atrophy or functional disturbance of the thyroid gland; and an undevlopmental state of the reproductive organs.

The hair, which is usually confined to the head,—sometimes trace on pubes and in axilla—is coarse and low on forehead.

The skin, of a muddy yellow color, is thick, dry, harsh, rough, peeling, wrinkled, loose and flabby. Perspiration is rare and

eczema common. The sub-cutaneous tissue thick and boggy, contains much mucin, giving the appearance of edema. The hectic spots are sometimes noticeable on malar, hands and feet, appear of a yellowish or mahogany color, like in Addison's disease. Goitres of all sizes are sometimes seen, especially in the supra-clavicular region.

The limbs are short, sometimes rickety. The epiphysis swollen and the shaft ossified. According to Virchow, there is an enormous overgrowth of cartilage, an arrest of growth of the distal ends of the bones, and a premature ossification of the shaft.

The hands and feet, fingers and toes, are short and stubby, sometimes webbed. Virchow speaks of the head as brachycephalic, due to the premature ossification of the sphenobasilar bone, and the closing of the sphenoid and basi-occipital statute, which should remain separate until the fifteenth year. The early ossification in some parts and delayed ossification in others produces the cretinoid characteristics of the head and face. The skull is broad and flat, sutures and fontanelles late in closing and the forehead low.

There is a semi-bestial expression to the face. The eyelids are thickened, sometimes obstructing vision; the nose swollen, short, flattened and sunken at the root. The lips are large, thick and pendulous, of a dark purple color, and always separated by a thickened, lolling tongue. The wide open and blubbering mouth is due in a measure to hypertrophy of the Schneiderian membrane; the teeth are late in appearing and soon decay. The whole face, stolid and bestial. The breast is often swollen, and the abdomen is pendulous, flabby, sometimes tense, and the umbilicus protruding.

The muscular system is weak and flabby. The subject is late sitting or standing. There is marked lordosis. Their walk or waddle has been likened to that of an hip-

popotamus. All movements are slow and uncertain, and at times there may be partial or general paralysis.

The circulatory system is noticeably affected. There is a diminution of the red blood corpuscles and of the hemoglobin, hypertrophy of the left ventricle, sometimes interstitial myocarditis, endarteritis, atheromatous and amyloid degenerations.

The patient is, therefore, subject to a slow and weak circulation and respiration, low temperature, headache, muscular pains, constipation, and variable appetite. He suffers from the cold and is troubled with frequent, sometimes painful, micturition.

The urine in specific gravity varies from 1008 to 1014, and sometimes contains albumen and casts.

The mental condition of the cretin is one of profound torpor; in sporadic cases, depends upon the grade. They are usually harmless, good-natured, quiet, stupid, dirty idiots, and a child of twelve or fifteen years will have the mental capacity of an infant. The voice is husky, monotonous and disagreeable, and speech is usually unintelligible. Crying is rare and distressing. Cases uninfluenced by treatment continue in the condition, probably slightly improving in warm weather, to relapse again in the winter. Their condition predisposes them to acute disease, which often terminates their miserable existence. Others continue to grow weaker, both bodily and mentally, and death occurs in a comatose state. The cretin living to fifteen or thirty years has no signs of puberty and no reproductive power, which marks the depth of this degeneration even to the extinction of a race, the pariah of nature.

The etiology of cretinism has been proven by Bromwell and others. In his series of forty-four cases Bromwell performed ten autopsies; in nine no trace of the gland could

be found, and in one the gland was the seat of a large tumor.

Heredity of a goitrous, neurotic and tubercular tendency undoubtedly have an influence in the production ofcretins, as well as location in the endemic form. In sporadic cases, however, no claim is laid to transmission, but where we find severalcretins in one family we are led to believe that the same influences that tend to produce endemiccretins are at work in the sporadic cases, excepting those caused by traumatism.

Experiments by Lusting and Carle point to the possibility of a microorganism being an etiological factor in this disease.

Two theories have been advanced regarding the functions of the thyroid glands relative to the production of cretinism. One is that the "gland secretes some substance essential to the healthy and harmonious working of the central and peripheral nervous system. By want of this substance the nervous mechanism is deprived of something which regulates the formation and deposition of mucin products, the mucin being consequently deposited in superficial and finer meshes of the corium, impairing motility and impeding nervous impulses." The second theory is that the gland "excretes from the blood some materials formed in the body metabolism, which by their retention causes a form of toxæmia, affecting principally the cerebral centres and the nervous mechanism concerned in mucin metabolism; the product of some substance which counteracts the abnormal constituents of the blood." This is demonstrated by the rapidity with which edema disappears under treatment, and therefore in health acts on mucin constituents, which if left to pass freely through the body becomes deposited as mucin. The thyroid gland being ductless, points to a secretion rather than an excretion, and implanting thyroid gland in the

body, followed by improvement seems to indicate the secretion of some substance neutralizing the toxic materials in the blood and system.

The diagnosis of a fully developed, typical cretin is unmistakable to the physician who is at all familiar with the subject. It may be necessary at times to differentiate from other forms of idiocy, but in the early stages where a diagnosis is most important and where treatment is most beneficial the cases are frequently overlooked. They are sometimes mistaken for rachitis, on account of the distortions and open fontanelles, or nephritis, on account of the occasional albuminuria, so a few special points must be kept in mind: First—The defective development is not limited to the ossious system. Second—The apparent edema does not pit. Third—The sub-normal temperature from 96° to 97.5° F. per rectum. Fourth—The characteristic cretin appearance as described above. Fifth—Observe in the newborn and early infant a slowness in observing and noticing things and objects, and paying of no attention to noises, lying quiet indefinitely, rarely crying; no desire to sit up or even hold the head up; complete inactivity; and the open mouth and protruding tongue. These conditions the parent believes the child will outgrow. And, lastly, Sixth—The effect and improvement under the influence of thyroid treatment.

The advent of thyroid therapy in myxedematous conditions and the proof of the similarity of cretinism to adult myxedema led to the employment of the thyroid gland in the treatment of the former condition.

Patterson and Bailey collected forty cases treated by thyroid extract, and no case failed to improve. This, with other reports, emphasizes the thyroid gland as a specific in this most deplorable condition. In appropriate cases the results following thyroid treatment is little short of marvelous. Dr.

Hertoghe of Anvers declares the arrest of growth due to thyroid inadequacy may be corrected even at a relatively advanced age (twenty to twenty-seven years) by thyroid medication.

The mental condition, which is probably limited by original imperfect formation of brain, is markedly improved, and the physical growth may be so rapid as to entail the risk of rickety distortions of long bones. Dr. Gibson, in 1891, grafted the thyroid gland of a lamb into the mammary region of a cretin, the subject improved for six months, and then relapsed. In 1892 intraperitoneal grafting was successful. Dr. Affleck, in 1893, reported to the Edinburgh Medical and Chirurgical Society thyroid grafting on three occasions. Dr. Robins, in 1892, tried injecting thyroid juice following grafting. Dr. Thompson, in 1893, reported a case that grew four and three-eighths inches in twelve months on one quarter of a sheep's gland twice a week. Dr. Bromwell mentioned a case that grew one inch in five weeks and another sixteen years old and twenty-nine and a half inches tall, that grew six and a half inches in six months.

In young subjects there is a complete change in a short time; the idiotic expression is lost, the pachydermatous condition disappears, the abdomen and umbilical prominence retract; there is a rapid increase in stature, the skin desquamates and assumes a normal tint; dentation and menstruation may occur, and there is marked intellectual and physical improvement. The increased metabolism is shown by the elevation of temperature, activity of the skin, mucous membrane and kidneys, and at times a loss of weight.

Dr. Gauthier suggests the use of fresh thyroid from the young sheep, and carefully describes how the Doctor should get the lobes himself, free them from connective tissue and prepare a glycerine extract. Dr. Murray's original preparation was the expressed

thyroid juice in equal parts of glycerine. These preparations were useful, while experimental pharmacists were producing a dried extract, most of which was inert. Now, however, by a more perfect method we have at our command tablets of the dried powdered gland representing a certain percentage of the fresh thyroid gland.

The dose depends much upon the age, although the young bear the remedy well. It is better to begin with a small dose two or three times a day, and watch the effect. If there is no improvement, gradually increase the amount of dose until the temperature of the cretin remains between 97° and 99° F. An elevation of temperature to a 101° F., with fretfulness, marked perspiration and loss of weight, indicates a moderation of the dose or a rest for a few days. After a time a moderate dose may be given at longer intervals—two or three times a week—but a discontinuance of the treatment from six to ten weeks is usually followed by a slow deterioration.

CASE No. 1.—James, colored; born July 28, 1894, D. C.

Came to Eastern Dispensary June 30, 1899, having been previously treated for rickets. Acquainting the mother with the child's condition, I prescribed a half tablet of P., D. & Co.'s thyroids (this amount representing two and one-half grains of the fresh gland) night and morning, requesting his return the following day for photographing. To my annoyance, I saw nothing of the case until October 6, 1899, when he again entered the dispensary. His measurements at this time were as follows: Height, 31½ inches; weight, 28 pounds; circumference of chest, 19½ inches; circumference of head, 22½ inches; circumference of abdomen, 23½ inches (pendulous with umbilical prominence); anterior fontenel open and pulsating, 1½ by 1½ inches; from acromian process to tip of middle finger, 13 inches; from

crest of ilium to floor, 18 inches; rectal temperature, 96.6° F.

His history as given by the mother: Cut his first tooth at three and a-half years. Could not stand alone until four and a-half years, and is now uncertain, but can move about by holding to a table or chair. The mother describes him "as the curiosity of the neighborhood; forever making water; slobbering his tongue like a lump of meat between his teeth and lips; so stupid that he would sit alone for hours if not disturbed; that in speech and manner he would try to mimic what was said to him, but he could not say anything himself that could be understood."

He was again put upon the thyroid one-half tablet night and morning; temperature rose to 99° F.; circulation to 112; respiration to 24. The first photographs were not obtained until November 13th. [Figs. 1 and 2.] Again photographed November 26th. [Figs. 3, 4 and 5.] Last photographed December 20th, 1899. [Fig. 6.]

January 6th his temperature registered 97.6° F. The dose of thyroids was doubled. At this time he is playful, bright and mischievous; the fontenel is closing and the abdomen retracting. The tongue is now retained in the mouth, and his expression greatly improved. In the three months—from November 6th, 1899, to January 6th, 1900—he has grown three and seven-tenths inches, which is nothing short of being remarkable.

CASE No. 2.—Edna, sister of James, born July 15, 1896, D. C. Was discovered November 13th, when a visit was made to photograph James. She does not walk or stand alone; has six teeth; rectal temperature, 96.5° F.

Height, 29.5 inches; circumference of head, 20 inches; circumference of chest, 19.2 inches; circumference of abdomen, 23 inches.

Has the characteristic expression of the

face and a most distressing, hoarse cry. She was placed upon one-fourth tablet night and morning, the temperature reaching 99.5° F., returned to 98° F., where it remained. In less than two months she has finished teething; grown one-half inch taller, and is somewhat brighter.

CASE No. 3.—Leo, brother of James, born May 27, 1898, D. C. Passed unobserved until within a few weeks, when I chanced to notice the thickened tongue then between the lips. He had two teeth, and the anterior fontenel 2.5 by 5 inches. His height is 28 inches; cannot stand alone; abdomen slightly enlarged, thyroid gland swollen; rectal temperature 100° F.

The occurrence of three cases in one family is an exception to the rule, in sporadic cretinism, as only one case is usually found, the other members of the family being normal in every respect. There is an older sister about eight years that is ænemic and shows a tubercular tendency. The parents are strong and healthy, and no history of tuberculosis, syphilis or goitre can be elicited other than that the mother was in the hospital for some weeks with "scrofula of the eyes." This was probably a latent form of syphilis, and may have had its influence on the children. They live in a miserably unsanitary condition on a poor and scanty diet.

In closing, permit me to suggest that cases of idiocy, semi-idiocy and simple arrest of development are many times due to a functional inactivity of this gland, without which man would be reduced to a state of feeble-mindedness, imbecility and extinction. That a continued careful study will enable us to diagnose and effectually treat these cases before the brain and nervous system has been hopelessly stupefied, and for the present all praise to the men who have assisted in one of the greatest triumphs of experimental investigation and observation in the nineteenth century.

I wish to acknowledge my indebtedness to Parke, Davis & Co., who have kindly furnished the thyroids for the treatment of these cases. Also to Dr. Miner and Mr. Austin for photography.

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### A Rational Treatment of Typhoid Fever.

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It behooves the self-respecting practitioner of medicine to seek for the exciting cause or causes of disease and to destroy or remove them if possible.

It must be recognized that there is a tendency of organized bodies to return to their normal structure and functions when the causes that deflected them from health have been removed.

The rational or scientific treatment of disease seeks to accomplish the removal or destruction of the cause or causes of disease in order that this tendency of tissue to rectify deviations from health may be exercised.

When a cause is well known, its location defined, and methods of removal or destruction at hand, no one would be justified in resorting to palliative measures, directed at the phenomena of rather than at the cause of the disease.

To resort to supportive measures, under the above conditions, until the disease limits itself or the exciting cause disappears, relying upon the tendency of tissues to return to their normal condition; a tendency which is impaired in proportion to the length and severity of the disease; is, to say the least, reckless practice of medicine. If, therefore, I can locate the exciting cause of typhoid fever beyond a reasonable doubt, and demonstrate that the disease can be shortened materially by the judicious administration of drugs di-

rected at this cause, the profession must agree with me that this method has a just claim to be termed scientific, and by virtue of this claim demands a fair and impartial trial by all who without fear of giving credit to whom it is due, seek the best method of treating the disease.

Typhoid fever is an infectious disease, characterized anatomically by hyperplasia and ulceration of the lymph follicles of the intestines, swelling of the mesenteric glands and spleen and parenchymatous changes in the other organs, the bacillus of Eberth is constantly present in the lesions. Clinically, the disease is marked by fever, rose-colored eruptions and diarrhoea.

That the bacillus of Eberth is always found associated with typhoid fever, and constitutes the exciting cause is generally admitted. It is also admitted that the toxines produced by this bacillus are the causes of the phenomena observed in typhoid fever.

No one doubts that the vast majority of typhoid fever patients contract the disease by means of food or drink containing the bacillus of Eberth. That the bacilli may be swallowed in the dust is acceptable as the origin of a few cases. There is an interval of about eighteen days from the inception of the bacilli to the development of fever, called the period of incubation, the abode of the bacilli during this period is of vast importance. It is not likely that the bacilli enter the blood from the mouth oesophagus or stomach, and then by selection attack the lymphatic tissues of the intestines. The mouth would seem to be the antrium and the intestines the road along which the bacilli must pass before entering the tissue of the intestine or their toxines be absorbed. The slight pathological changes found in the intestines as early as forty-eight hours after the beginning of fever fairly disprove the possibility of the intestinal wall being the seat of multiplication for the previous twenty days. The clin-

ical picture of the disease, however, proves the existence of toxine in the body at least eleven days before this. Where, then, has been the seat of multiplication during the incubative period?

The bacilli of Eberth grow on artificially digested food. It grows on the same media and under the same conditions as the bacillus coli communis which flourishes in the intestinal tract. Dellafield and Pruden emphatically state that the bacillus of Eberth is found in enormous quantities in the contents of the bowel. Osler states that the bacillus of Eberth is found in the contents of the intestines in irregular clusters. Therefore, if the pathological changes of the intestines found in the early days of fever do not justify that the walls of the intestines have been the seat of the multiplication for the previous twenty days, is it not reasonable to conclude, for the reasons given above, that the bacilli do multiply on the intestinal walls and in their contents during the period of incubation.

The present methods of detection and identifying the bacillus of Eberth are imperfect. The difficulties of differentiating and detecting them are increased by the luxuriant growths of other bowel bacilli smothering them, and it is not until the Eberth bacilli has multiplied to such an extent as to withstand this do we find them in the stools with any surety. This, we have every reason to believe, does take place, and would explain why the bacilli are sometimes not found in the stools until the tenth day of the disease. The fact of their detection in the stools at all after the beginning of fever would prove beyond contradiction that the bowels contain them.

It seems reasonable, therefore, to assert that from the time the bacilli enter the body until the patient is convalescent, at least the Eberth bacillus lives, multiplies and manufactures typhoid toxine in the bowel canal. Or, in other words, the intestinal canal is a

circumscribed area of infection containing the exciting cause of typhoid fever from the beginning to the end of the disease. From this area of infection, or, if you please, source of infection, the bacilli enter the tissue of the intestine. The entrance of the bacilli is probably marked by the first rise of temperature. The pathological changes found in the first forty-eight hours after the first rise of fever would indicate the truth of this statement. The subsequent infection of the lymphatic tissue throughout the body is the usual course of all disease due to microbe life and does not belong to typhoid fever alone.

We have but to disabuse our minds of the erroneous conception of typhoid fever, and shake off the fear of displeasing our preceptors to find the rational treatment of this disease. We have the cautery for infectious bites, the knife to evacuate pus cavities, the evacuant for diarrhoeas, the expectorant for coughs, the diuretic for uræmia, the antiseptic for infected wounds—everywhere in medicine we are taught to strike at the cause of disease; but in typhoid fever,—here we follow blindly the lead of a few, who, satisfied with a treatment unscientific in itself and unsatisfactory to many, condemn without a hearing and pronounce as worthless without a trial all treatments not advocated by themselves.

If the source of infection in any disease is destroyed before the resistance of the tissue is overcome the poison already in the system will be eliminated and a recovery should ensue. Therefore, a treatment directed at the cause of typhoid fever would be one that should accomplish the destruction of the Eberth bacillus and their removal, together with the unabsorbed toxines from the bowel, and the tendency of the tissue to reconstruction should insure a speedy recovery.

In the effort to apply rational medicine to the above conditions many methods have been advocated. All have lacked either one

or the other of two important elements: The evacuant methods have lacked the antiseptic factor; the antiseptic methods have lacked the evacuant essential. It remains for Dr. Woodbridge of Cincinnati to advance the combined treatment. A treatment to evacuate the area of infection and cleanse it with an antiseptic solution.

A brief physiological study of the drugs entering into the treatment of typhoid fever suggested by Dr. Woodbridge will show that he has combined in his treatment both essential factors to successfully combat the conditions existing in this disease.

CALOMEL.—Calomel produces an increased biliary discharge from the bile ducts. It causes an increased flow of all intestinal secretions; it increases the peristaltic action of the intestines, which probably mechanically influences the flow of the secretion and increases its purgative properties. All of these effects of calomel are better produced by small doses frequently repeated. (*Foster.*)

PODOPHYLLUM.—The resin of podophyllum directly stimulates the liver to the production of bile. (*Rutherford.*)

GUIACOL CARBONATE.—The carbonate of guiacol acts as a tonic to the mucous membrane of the alimentary tract. It splits up in the intestines into carbonic acid, and guiacol, both strong antiseptics. The compound lacks taste and odor; it does not irritate the digestive tract. (*Foster.*)

MENTHOL.—Menthol given internally is a powerful, though comparatively harmless, stimulant. It is an antiseptic, and being of a high volatile character, it is readily diffused. (*Foster.*)

THYMOL.—Thymol in its physiological action bears a resemblance to carbolic acid. It is said to interfere more powerfully with germ life, while at the same time it is much less caustic, irritating or poisonous. (*Foster.*)

**EUCALYPTUS.**—Oil of eucalyptus is like all the essential oils and antiseptics; administered internally it increases the flow of the gastro-intestinal fluids. (*Foster.*)

Thus we see the physiological effects expected from the foregoing drugs, combined in proper proportion and administered intelligently, should produce free evacuation and intestinal antisepsis. To recapitulate, we have before us by the time a diagnosis of typhoid fever is made a bowel canal containing enormous numbers of Eberth bacilli. The typho-toxine, which is formed by their life process, is supplying the blood with the poisons which produce the phenomena we recognize as the disease. The tissues of the bowel are being invaded by the bacilli themselves, causing hyperæmia, cell proliferation and a mucous catarrh. Nature is frequently at this stage making her effort to throw off the irritation in a diarrhoea. With this picture before you, introduce into the bowel, the drugs I have named in doses and frequency suitable to the patient and the results to be expected are these: The calomel and podophyllum, calling forth an increased flow of bile and intestinal secretions, assist the diarrhoea of the disease in flushing out the bowel, removing bacilli, living and dead, their toxines, dead cells and other detritus. The diffusible antiseptics suffuse the contents of the bowels, killing, or at least inhibiting, the bacilli free purgation fails to remove. In other words, we, by the frequent administration of these drugs, constantly wash out the area from which the patient is being infected, with copious flow of natural secretions carrying non-irritating antiseptics. In support of these ideas I append a report of fifteen cases of typhoid fever attended by myself in different sections of the county, and in widely different social positions.

#### REPORT OF CASES.

CASE No. 1.—Female, age 36. Treatment begun about fifth day of disease. Evening temperature,  $104\frac{3}{4}^{\circ}$ . Temperature normal on twelfth day. Length of fever after beginning treatment, seven days. Twenty-nine stools during seven days. No delirium.

CASE No. 2.—Male, age 15. Treatment begun about fifth day of disease. Morning temperature,  $103\frac{3}{4}^{\circ}$ . Temperature normal on sixteenth day of disease. Fever lasted eleven days; slight delirium. Twenty-four stools in the eleven days. Patient salivated on sixth day. Treatment was suspended two days.

CASE No. 3.—Male (colored), age 27. Treatment begun on fourth day of disease. Evening temperature,  $104\frac{3}{4}^{\circ}$ . Temperature normal on twelfth day. Eight days of fever; no delirium. Thirty-six stools in eight days.

CASE No. 4.—Female, age 40. Treatment begun on seventh day. Temperature,  $104^{\circ}$ . Temperature normal on fourteenth day. Seven days of fever; no delirium. Twenty-one stools in seven days.

CASE No. 5.—Male, age 10. Treatment begun on seventh day. Morning temperature,  $103\frac{3}{4}^{\circ}$ . Temperature normal on thirteenth day. Six days of fever. Twenty-seven stools in six days. Widal reaction positive.

CASE No. 6.—Male (colored), age 30. Treatment begun on fourth day of disease. Morning temperature,  $104^{\circ}$ . Temperature normal on twelfth day. Eight days of fever; no delirium. Thirty-six stools in eight days.

CASE No. 7.—Female, age 32. Treatment begun on sixth day of disease. Morning temperature,  $105\frac{3}{4}^{\circ}$ . Temperature normal on fourteenth day. Eight days of fever; no delirium. Forty-four stools in eight days. Widal reaction positive.

CASE No. 8.—Male, age 10. Treatment begun on seventh day of disease. Morning

temperature,  $105\frac{3}{4}^{\circ}$ . Temperature normal on sixteenth day of disease. Nine days of fever; no delirium after first day of treatment. Stopped tablets on eleventh day of disease. Temperature rose from  $100^{\circ}$  to  $102^{\circ}$ ; dropped after beginning tablets. Forty-seven stools in the nine days.

CASE No. 9.—Female, age 30. Treatment begun on fifth day of disease. Temperature,  $104^{\circ}$ . Temperature normal on fourteenth day of disease. Nine days of fever; no delirium. Thirty-seven stools in nine days. Widal reaction positive.

CASE No. 10.—Male (colored), age 27. Treatment begun on seventh day of disease. Morning temperature,  $104\frac{3}{4}^{\circ}$ . Temperature normal on fifteenth day. Eight days of fever; no delirium. Sixty-five stools in eight days; thirty-six stools in first four days.

CASE No. 11.—Female (colored), age 24. Treatment begun on third day of disease. Morning temperature,  $104^{\circ}$ . Temperature normal, twelfth day. Nine days of fever; no delirium. Forty-one stools. Widal reaction positive.

CASE No. 12.—Male, age 28. Treatment begun on fourth day of disease. Evening temperature,  $104\frac{3}{4}^{\circ}$ . Temperature normal on thirteenth day. Nine days of fever; no delirium. Thirty-three stools. Widal reaction positive, second trial.

CASE No. 13.—Female, age 21. Treatment begun on third day of fever. Morning temperature,  $102^{\circ}$ . Temperature normal, fourteenth day. Eleven days of fever. Temperature,  $99^{\circ}$  on eighth day. Patient sat up, and stopped medicine. Temperature  $102^{\circ}$  on tenth day; begun treatment actively (ten stools in twenty-four hours). Thirty-six stools in eleven days. Widal reaction positive.

CASE No. 14.—Female, age 17. Treatment begun on fifth day of disease. Evening temperature,  $104\frac{3}{4}^{\circ}$ . Temperature normal on sixteenth day. Forty-five stools in the eleven

days of fever. Great frontal headache, but no delirium. Headache ceased on second day of treatment.

CASE No. 15.—Male, age 4 years. Treatment begun on fifth day of disease. Temperature,  $104\frac{3}{4}^{\circ}$ . Temperature normal on fourteenth day of disease. Delirium very severe, and lingered after temperature became normal. This case had eight baths from 5 A. M. to 10 P. M. on the first day I saw him. Woodbridge treatment was begun at 12 M. and baths were dispensed with ten hours afterward. Twenty-seven stools in nine days. Widal reaction positive.

From the foregoing report, it would seem that I have aborted fifteen cases of typhoid fever with the Woodbridge treatment, or I have had an almost impossible run of luck in meeting fifteen consecutive cases of abortive typhoid fever. My diagnosis may be questioned. The Widal test was found positive in seven of the cases; it was not looked for in eight cases. Rose spots, diarrhoea tenderness and the other well-known symptoms, collectively or singly, assisted me in my diagnosis. Quinine was given at the beginning of each case for diagnostic purposes. I, therefore, am ready to stand by the diagnosis in each case.

Since we recognize that nature frequently aborts typhoid fever, the opponents of this method place themselves in a rather ridiculous light when they claim that the disease cannot be aborted. If nature alone can accomplish this, nature, assisted by judicious medication, should accomplish more. The charts show a relation between the temperature and the stools. Following profuse evacuations of the bowels, the charts show a remarkable drop in the temperature. In other words, as soon as the infected area—the bowel canal—is evacuated and flushed with antiseptics, the temperature drops, and instead of considering this an unusual result

we have but to turn to surgery to be convinced that it is the result to be expected. The remarkable short time the fever lasts under this treatment demonstrates that the source of supply being limited, the natural resistance of the tissue and the eliminating powers of the secretions take care of the poisons already absorbed, and for want of a fresh supply the disease is limited.

I have given up the routine recommended by Dr. Woodbridge. I use the tablet and capsule bearing his name because they contain the drugs I wish to use in the most convenient form. I administer the No. 2 tablet only because, for simplicity sake, I do not want to use two tablets essentially the same. I administer the tablets with the definite purpose of purgation and as a means to introduce antiseptics into the bowels. I administer the tablets in sufficient numbers to insure at least eight passages in twenty-four hours, and more if possible. I have seen eleven stools in sixteen hours from a delicate woman, followed by marvelous good results. The failures many have met with in using the Woodbridge treatment have been due to the fear of producing too many stools. The object sought is to remove the germs, toxines, dead tissue and inflammatory products. The statistics given out that cases with profuse diarrhoea do badly under the Brandt treatment may be true; they, however, have no application to the Woodbridge treatment. The profuse diarrhoea of typhoid fever is an effort of nature to remove the irritation from the bowel, and unassisted I can well see how nature would be unable to cope with the great quantities of Eberth bacilli typho toxine, dead cells and detritus that must exist in the bowel in these severe cases. On the other hand, the diarrhoea produced by the administration of the drugs recommended by Woodbridge is a diarrhoea produced by the physiological action of drugs to remove the cause of the diarrhoea.

It is as sensible to claim that to give a purgative to remove the irritation in irritative diarrhoeas is bad practice as to claim the purgation of typhoid fever patients to remove the irritation increases the mortality. One statement is equivalent to the other, and both are ridiculous.

I have left the consideration of the diet until the last, because I have but to say I follow in the footsteps of the immortal Gray, and feed fevers. A light, digestible diet, such as would be given in any fever, is administered and given in such quantities as the patient may desire.

I ask in behalf of humanity a fearless and impartial trial by all impartial men. I ask, of those who say, "I have not tried it, but am convinced of its inefficiency," a trial, that their convictions may be altered. Let Dr. Woodbridge's name be associated with the treatment, and give him the credit of offering the profession a rational and scientific method of treating one of our most fatal diseases.

### The Diagnosis of Gastric Cancer.

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Associate Professor of Physiological Chemistry,  
Baltimore Medical College.

The early diagnosis of cancer of the stomach is of interest to the physician as offering the only hope of a cure with the resources at present at his command, and a diagnosis even in the later stages will save him from the consequences of an erroneous diagnosis, and also the patient from the annoyances of futile and often harmful methods of treatment.

The diagnosis must be based upon a careful analysis of the clinical history, physical examination, results of a chemical and bacteriological examination of the stomach contents, and the examination of the blood, urine, etc.

The clinical history of cancer of the stomach varies to a certain extent with location and variety of the carcinoma, the stage of the disease, and the presence or absence of metastases. The patient, usually after the fortieth year, gives a history of having formerly been perfectly healthy. A few months before he began to notice falling off of the appetite, with a feeling of oppression after eating, and at times distention and regurgitation. In spite of medical treatment and regulation of the diet, the symptoms have not improved; on the contrary, have gradually grown worse. Hand in hand with the pain, distension and loss of appetite comes a gradual emaciation, loss of energy, distaste for articles containing a large amount of proteid, and a gradually increasing constipation, which the patient and his physician usually describe as the cause of all the difficulty. From time to time vomiting of poorly digested masses of sour-tasting food masses takes place, at times showing presence of food taken one or more days before.

In less advanced cases or in carcinomata affecting other regions of the stomach the picture varies, but is in essential features the same.

The physical examination in advanced cases will often render the diagnosis certain. The presence of a tumor in connection with the stomach, the existence of dilatation, and visible peristalsis are the most marked symptoms.

It is not my purpose, however, in this paper to enter into a detailed discussion of the methods of physical examination, as they are treated at length in all the text-books of medicine and diagnosis. Some of the more recent methods may find mention as the gastroscope, the illumination of the stomach according to the method of Einhorn and the X ray.

The gastroscopic examination is a difficult one, and even in the hands of the originator

has not proven of great value. Whether it will ever be perfected, so that the general practitioner can employ it with success seems doubtful.

The illumination of the stomach according to Einhorn's method is only of limited application. Given a tumor upon the anterior surface of the stomach of a sufficient thickness and extent, there is no doubt that its existence would be shown by this method, but as, according to the statistics of Lebert, only 3% of gastric cancers are upon the anterior wall, the limits of its utility are easily seen.

The appearance of a tumor of the stomach by the X ray would not be characteristic unless the tumor were of considerable size, in which case the tumor would be usually easily palpable.

The clinical, microscopical and bacteriological examination of the gastric contents will undoubtedly furnish us in the great majority of cases with the first clue to the diagnosis.

After washing out the stomach thoroughly the previous evening, some suitable test meal or breakfast should be given and after a suitable interval withdrawn. To gain a general knowledge of the condition of the gastric digestion, there is no meal more suitable than that recommended by the late Dr. Salzer, and known by his name. This consists of two portions—a breakfast given at a convenient time in the morning consisting of one soft-boiled egg, one glass of milk, a half ounce of finely scraped rare roast beef and a plate of rice. Four hours after this the regular Ewald test breakfast of one roll without crust and a cup of hot water or of weak tea is given and after one hour the contents withdrawn.

Upon examination the amount remaining is found to be larger than under normal conditions, the food particles unusually coarse and the proteid portions especially very poorly digested, large particles of meat, white

of egg and of casein being readily seen. There may or may not be blood present. In bleeding from a cancer usually of a dirty brown "coffee-ground" appearance, readily distinguishing it from the fresh red blood seen where the blood is due to some lesion occasioned by the insertion or manipulation of the tube.

At times, too, the contents may show a frothy or foamy consistency, due to the formation of gas (chiefly  $CO_2$ ) by fermentation. The odor has nothing characteristic; there may be at times the offensive odor of the fatty acids. At this time careful search should be made for bits of mucosa or bits of the tumor, which are occasionally withdrawn by the tube. In case they are found they should be hardened and sectioned for study of their histological characteristics. In one case I have been able to make the diagnosis of an adeno-carcinoma of the stomach before a tumor was palpable. The diagnosis was confirmed by the autopsy. Cover slip preparations should also be made and stained with methylene-blue or other bacteriological stain. In cases of cancer of the stomach there are usually a large number of bacteria and the Oppler-Boas bacillus, a long bacillus slightly wider at one end than the other, is quite characteristic, though it *does* occur in benign stenosis with dilatation and stagnation.

At times the cells from the tumor or mucosa may show evidences of irregular cell division and peculiar mitotic figures. These are considered by Dock to be characteristic in cancerous disease of the peritoneum and pleura and may be of assistance in the diagnosis of the condition under discussion.

The chemical examination usually, but not always, shows absence of free Hcl. Exceptions occur, as in early stages of carcinoma and in two cases of *ulcus carcinomatosum* I have found free Hcl till the termination of

the disease, both cases being proven by autopsy. The absence of free Hcl, however, does not in itself, as was once thought, mean necessarily carcinoma. Free Hcl may be absent in (1) functional so-called "neurotic" anacidity; (2) as the result of atrophic gastritis, or in late stages of chronic gastritis; (3) in circulatory disturbances causing a chronic passive congestion of the stomach; (4) in some cases of renal disease; (5) in some of the severe forms of anæmia, and (6) is a fairly frequent condition in tuberculosis. Further examination shows the presence of lactic acid usually fairly early in the disease. In cases where it is found, it should not be forgotten that nearly all the different test meals contain small amounts of lactic acid, and that it may be formed by the acid of bacteria in the mouth. The danger of error from this source may be minimized by washing out the stomach thoroughly if necessary several days in succession until absolutely clean, and then giving oatmeal gruel, recommended by Boas, prepared by boiling down 1000 cc. of water, to which a tablespoonful of rolled oats has been added to 500 cc. This is withdrawn one hour after its administration, and should always be employed in cases where a quantitative determination of the lactic acid is to be made and in all doubtful cases.

It has been stated that lactic acid only occurs in cases where the following conditions are present: (1) Absence of free Hcl; (2) stagnation; (3) impaired gastric resorption; (4) impaired proteid digestion. The absence of free Hcl is not unconditionally necessary, as in the two cases of *ulcus carcinomatosum* referred to above, lactic acid was present in considerable amounts, even though free Hcl was present till death. If the precautions mentioned above be observed, the presence of lactic acid in amounts more than a mere trace appears to be strongly indicative of cancer of the stomach.

The fatty acids may also occur, but have less significance than lactic acid.

In the further examination of the gastric contents it will be found that the amount of pepsin or of its zymogen, as measured by its proteolytic power, according to the methods of Hammerschlag or of Mett, is much decreased, as is also the rennet ferment or its zymogen.

In making a careful examination of any obscure case in which gastric carcinoma is suspected, a full analysis of the urine and careful examination of the blood is as necessary as that of the stomach contents. The changes in the blood depend partly upon the character of the tumor, its growth, the amount of morbid material absorbed from it, which we may consider as direct results, and upon the amount of hemorrhage. When the amount of blood lost is large, we will have blood conditions resembling that found in hemorrhage in any condition, viz., leucocytosis, loss of red corpuscles, decrease of haemoglobin, the regeneration of the red corpuscles taking place more rapidly than the manufacture of haemoglobin, the leucocytes returning again to their normal number in a few days, provided there is no repetition of the hemorrhage.

As the direct result of the tumor we have a certain degree of anæmia which may become excessive in the later stages. This anæmia seems to be dependent upon two factors: (1) The destructive action of the cancer poison, whatever that may be, upon the red corpuscles, causing their destruction, as shown by the increased elimination of urobilin, and (2) the effect demonstrated by Grawitz of a dilution of the blood by an increase in its volume at the expense of the lymph. The number of red corpuscles may be decreased to 1,000,000 or less, but as a rule will average over 2,500,000. A greater decrease in the amount of haemoglobin takes

place, so that a condition of psuedo-chlorosis is present in well-marked cases. Cases in which the absorption of fluids is very much interfered with, as in cancer of the cardia, with stricture of the cesophagus, and in late pyloric carcinoma with marked dilatation, the picture becomes masked by the insufficiency of the water supply, and we find a normal or even increased number of red corpuscles per  $\text{mm}^3$ , an increase of haemoglobin, dried residue of blood and of the serum. The red corpuscles in early stages usually show only the changes common to any severe secondary anæmia, but at times a blood picture resembling that found in pernicious anæmia is found with microcytes, megalocytes and poikilocytes; also nucleated red corpuscles of both the ordinary and giant (megalocyte) varieties.

The behavior of the leucocytes is of especial value in the differentiation of pernicious anæmia from gastric carcinoma. In pernicious anæmia we find a decrease in the number of leucocytes, values of from 1000 to 2000 per  $\text{mm}^3$  being not very uncommon. In cancer of the stomach, on the other hand, the values lie from the upper border of the normal limits upward. In judging of the presence of a leucocytosis, it must not be forgotten that there is a certain amount of normal variation in different individuals with regard to the condition of nutrition, people of active life with generous diet showing considerable increase, compared with others whose diet is not so nutritious and whose metabolism consequently is less active. An anæmic, poorly nourished, cancerous patient with a leucocyte count of 10,000 per  $\text{mm}^3$ , should be considered to have a leucocytosis, while the same number in a healthy subject would not be pathological. The digestive leucocytosis which occurs in health does not occur in cancer of the stomach—a fact which is of some importance not only in the diagnosis of cancer of the stomach, but in the

differential diagnosis from a non-malignant pyloric stenosis.

The urine changes depend in part upon the situation of the cancer. So long as the absorption of water is not interfered with, the amount of urine remains practically unchanged. When high-grade stenosis of the cardia or of the pylorus is present, the urine becomes scanty, an increase being usually an indication of improvement.

The reaction is usually acid, but does not show the curve of acidity which is characteristic of normal digestion, due to the absence of secretion of HCl. by the stomach. Albumen frequently occurs, may be only an occasional symptom appearing and disappearing irregularly. Albumose, the peptone of the older authors, occurs frequently, owing its origin either to albumose-formation in the tumor or upon its surface or to absorption of albumose from the stomach, a so-called enterogenous albumosuria. Except when the pancreas or liver is encroached upon by the tumor, we do not find sugar present. Indican is present in increased amount in a large majority of these cases, its source being either an increased interstitial putrefaction or resorption from the ulcerating tumor surface.

The amount of nitrogen eliminated is larger than can be accounted for by the amount of nitrogen in the food ingested in

almost all cases, showing a pathological proteid metabolism. Clinically, this can easily be seen, as the patients lose not only their fat deposits, but at the same time become "muscle-poor" and their muscular power diminishes. Even when the amount of food ingested is larger and absorption is fairly good it may be impossible to prevent this loss of body nitrogen. Of especial interest, however, is the division of the various nitrogenous constituents. The question has been carefully studied by Töpfer, and while the method with which he worked gave too high values for urea; still as the error occurred in both normal and pathological urines to the same degree, it does not invalidate his conclusions. In normal urines he found the nitrogen divided as follows: As urea 96%, uric acid 1.8%, ammonia 1.2%; and extractives 0.6 to 0.8%. In variously located carcinomata he found values as follows: U. as urea less than 80%, uric acid 1 to 5%, ammonia 0.2 to 13%, and extractives 13% to 23%. Characteristic for the carcinomata is the large percentage of extractive matters, the nature of which, however, is very little known.

With the pathological proteid metabolism, there appears in the urine considerable amounts of acetone and diacetic acid, and in cases which end by carcinomatous coma B. Oxybutyric acid often occurs.

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Vol. III.

AUGUST 1st, 1900.

No. 1.

### Prospects for 1900-1901.

THE indications are that all the classes will be increased in numbers next year. The report comes from the Dean's office that the correspondence is heavier than ever before, and the prospects for enlarged classes are very bright. Our graduates did well before the various State boards, so far as heard from, and reports of well-established and lucrative practices are beginning to arrive from many of our recent alumni.

### Changes in Teaching Staff.

DR. J. WILLIAMS LORD has been appointed Associate Professor of Anatomy, to succeed Dr. Rowland. Dr. Lord is still Clinical Professor of Dermatology. Dr. W. A. Davis has been appointed First Assistant Demonstrator of Anatomy. Hon. Olin Bryan, State Senator from Baltimore City, has been elected to the chair of Medical Jurisprudence. Dr. W. Burton Stevenson has been appointed Assistant Demonstrator of Obstetrics. Dr. W. A. Montell has been elected Dean of the Dental Department to succeed Dr. J. W. Smith.

### New Department.

IN THIS ISSUE will appear the Dental Department, in charge of Professor W. A. Montell. He will be glad to receive papers

on dental subjects from any of our alumni or any of our teaching staff, and will also be very glad to receive news of any of our graduates. The movements of our alumni, knowledge of their success, their location, addresses—in fact, anything which will interest their classmates or former teachers will always be received with pleasure.

### Omission.

UNINTENTIONALLY, the name of Dr. J. Walter Hodges of Washington was omitted from the list of those in attendance on our last annual meeting and commencement. Dr. Hodges has been our most faithful "out-of-town" attendant, having been present at every commencement and annual meeting since his graduation, in 1892.

### Improvements.

WHEN the students return in September they will find a great change in the appearance of the clinical amphitheatre and the operating and dressing rooms of the hospital. These are now being improved by new tiled floors and wainscoting, new tables, sinks, etc., which will make them strictly up to date in every respect.

### Honors to Our Alumni.

WE ARE GLAD to be able to present in this number the article on *Sporadic Cretinism*, by Dr. Noble P. Barnes, Washington, D. C. Dr. Barnes is a graduate and first-prize man of Baeteriology in the Toledo Medical College. He strides in the practice of his profession. The National University has honored him by an election to the chair of Pediatrics. Dr. M. L. Bowman, of the Class of '92, is Professor of the Class of '93, and has made rapid progress. Dr. Bowman took a post-graduate

course at the Baltimore Medical College and at the Johns Hopkins in 1895.

—•—  
**New Jersey State Board.**  
—•—

THE State Board of Medical Examiners of New Jersey, on July 5, 1900, adopted the following resolution :

*Resolved*, That the Board will indorse the license of any State Board of Medical Examiners in the United States, in lieu of an examination; provided, first, that the candidates for indorsement shall present satisfactory evidence of having the academic and medical education required by this Board, and that the license presented for indorsement shall have been issued after a State examination of the same grade and kind as that required by this Board.

This is, we think, a step in the right direction. Heretofore men who had passed satisfactory examinations before one State Board were required to pass the same ordeal in another State, provided they desired to change their location. This was a manifest injustice, as men soon lose the ability to pass examinations in the fundamental branches after leaving college. The Board retains the privilege, and very properly, of satisfying itself that the education which an applicant has received is of sufficient thoroughness to suit the demands of that Board. This will prevent practitioners poorly qualified who have been licensed by careless State Boards from enjoying the privilege now given to well-equipped graduates.

—•—  
DR. CHARLES IRVING HILL, Class of '99, has been appointed an assistant surgeon to the Fourth Regiment, Maryland National Guard. Two others of our staff are already members of the surgical staff of the regiment—Dr. S. S. Ullrich, with rank of major, and Dr. Duncan McCalman, with rank of captain.

—•—  
DR. JOHN HUNTER, Class of '92, has been appointed to a position in the Westminster Hospital, London, England.

DR. J. H. CONLY ('99) is located at Adamstown. He paid the hospital a visit this month. He reports a pleasant situation and good success.

—•—  
DR. W. P. MILLER, Class of '92, is established in Hagerstown, and is meeting with unqualified success.

—•—  
DR. IRVING HILL has sailed for Europe, where he will spend some months. He will study nervous and mental diseases under Oppenheim of the University of Berlin, but will stop at the Paris Exposition on his way.

—•—  
THE following is a complete list of dispensary appointments :

DR. THOMAS W. KEOWN, A. B., *Dispensary Physician and Chief of Clinic*.

CLINICAL ASSISTANTS.

M. L. TODD, M. D., and A. A. HUNTLEY, M. D., *Clinical Medicine*.

A. P. HERRING, M. D., *Nervous and Mental Diseases*.

C. N. GABRIEL, M. D., and S. A. BAIN, M. D., *Diseases of Nose and Throat*.

W. B. McDONALD, M. D., and W. E. BURTON, M. D., *Clinical Surgery*.

J. K. B. E. SEEGAR, M. D., *Diseases of Women*.

R. S. KENYON, *Genito-Urinary Surgery*.

J. P. LAWLER, A. B., M. D., *Skin Diseases*.

M. B. HOOD, M. D., *Diseases of Children*.

J. C. LUMPKIN, M. D., *Diseases of Eye and Ear*.

FOOTBALL prospects are very bright. We are already beginning to hear of several new men—good players—who intend entering the Baltimore Medical this fall. The outlook for capturing the opening game from the Naval Academy is encouraging. Practice will begin about September 15. Coach BRAY and Captain BLAIR will both be on hand at that date to fashion the football material into a winning team. Since school closed we have heard from BLAIR, SCANNEL, NOBLE, WALKER, TURNER, HEBB and HENKEL. All of these will be with us again. With these and several new men, some of them veterans, to line up for us this fall victory must be ours.

THE following is a corrected list of the officers of the Alumni Association:

*President*—T. W. Keown, A. B., M. D.  
*Vice-President*—C. M. Cook, M. D.  
*Treasurer*—E. B. Freeman, M. D.  
*Secretary*—J. P. Lawler, A. M., M. D.  
*Executive Committee*—Wm. E. Moseley, M. D.;

Duncan MacCalman, M. D.; E. A. Smith, M. D.; W. A. Davis, M. D.; A. P. Herring, M. D.; T. L. Richardson, M. D.; J. K. B. E. Seegar, M. D.; I. G. Jeffers, M. D. *Ex Officio Members*—T. W. Keown, A. B., M. D.; David Streett, A. M., M. D. *Editor Alumni Journal*—J. M. H. Rowland, M. D. *Associate Editors*—T. W. Keown, M. D.; Duncan MacCalman, M. D.; A. P. Herring, M. D.

## Dental Department.

W. A. MONTELL, D. D. S., EDITOR.

THE DENTAL DEPARTMENT of THE ALUMNI JOURNAL makes its first appearance in this issue, and, like every new enterprise, should be able to give a good and sufficient reason for its birth and continued existence. Six years ago the Baltimore Medical College decided to undertake the instruction of dental students, and the wisdom of this act has been fully demonstrated by the phenomenal success of its Dental Department, with ninety-five matriculates and twenty-eight graduates for the year 1899 and 1900. Two years ago, recognizing the growing importance of the Dental Department, the Alumni Association by an unanimous resolution admitted to membership all graduates, past, present and future, of the Dental Department, and thus brought about a closer relationship and a mutual interest which has evinced itself in various ways since that occasion.

WHILE there are many interests in common, and many of the studies of a dental and medical student are the same, yet those medical branches taught a dental student are of so specialized a character as to render them of but little interest to the general practitioner, yet of great and absorbing interest to the dental specialist. Therefore, in

order to keep in close touch with all our Alumni, it has been deemed best to set apart a small portion of our JOURNAL for matters of interest to our dental graduates.

THE Editor of this Department takes up his work with a proper appreciation of its difficulties and a modest and becoming estimate of his own personal deficiencies, but trusts that the merits of the cause will, with the assistance of an honest endeavor to do his duty, enable him to win the forbearance of his friends, and advance the interests of the JOURNAL.

A FEW of our twenty-eight graduates of the Class of 1899 and 1900 have been heard from, with good records before the various State boards, and have located as announced, with license.

J. W. Bracken, New York, N. Y.

T. H. Charmbury, Seymour, Conn.

T. L. Cunningham, Cleveland, Ohio.

F. J. O'Donnell, A. L. Pette, A. N. Drury and J. W. Hanrahan passed the Massachusetts Board.

J. M. Jacobs and L. M. Coffey report their success with the North Carolina Board.

H. W. Holden, Rutland, Vt.

## Abstract Department.

IN CHARGE OF

DR. THOMAS W. KEOWN.

**Congenital Absence of Patella.**—Dr. Wuth (*Ach. f. klin. chir. Bd. 4*) describes a case where the male members of family only were characterized by the absence of the Patella. The man was an excellent rider and tourist, and did not suffer at all from the absence of the Patella.

The Quadriceps extensor tendon inserted in the abnormally large Tuberositas tibiae below, and rested between the condyles of femur above. Wuth's investigations in Comparative Anatomy as to the origin and purpose of the Patella lead him to believe that the same probably originated from the detachment of a formerly existing Tibial apophysis.

This view of Wuth then precludes the necessity of the Patella at all as a preventive of friction of the tendon on the femur; and if the Patella is the remains of a bone which has long since lost its real purpose, so is its occasional disappearance, where its presence is still usual, not to be wondered at.

As to the purpose of the Patella, Wuth claims for same a rather subordinate lever-action. As a compensation in Wuth's case, is the presence of the abnormally developed Tuberositas tibiae.

**The Action of the Alcohol Bandage.**—Buchner speaks of the natural powers of resistance of the organism and their influence in resisting infection. He does not believe that alcohol exercises a disinfecting action on the germs of infection, as it does not penetrate the skin; yet its local application causes the blood vessels to dilate to a greater degree than all other chemical agents. The irritation due to the absorption of water by alcohol acts also upon the dilating nerves of the vessel walls, as also upon the nerves of surrounding vessels. The diffused action of local alcohol applications may be shown by measuring the blood pressure of extremities subjected to the action of alcohol bandages. The blood pressure is increased, due to dilatation of the corresponding arteries; their power of resistance decreases.

The pressure increases, and involves the capillaries, and the veins receive a larger influx of blood. To sum up, there is an increase in the circulation of blood in the parts, and also a greater resorptive and anti-bacterial action of the blood, which is desirable in combatting infectious processes.

The field for application of the alcohol bandage would be Phlegmona, Abscesses, Boils, Panaritium, Caries of the Teeth, local Tuberculosis, etc.

Quite a number of such affections may be cured by the above method.

**Treatment of Epididymitis Gonorrhoeica.**—Chrzelitzer (*Deutsche Praxis*, 6, 1900) orders in the beginning of the disease (extreme sensitive-

ness of parts, drawing-down feeling, boring pains) application of ice to parts, with elevation of same.

Later on in the disease, with great swelling of organ, increased pain, general malaise, abdominal tenderness, etc., the treatment should be just the opposite. He now orders prolonged applications of heat. The scrotum is rubbed with a 10 per cent. ointment of Iodide of lead, or a plaster of same is applied, a hot moss-poultice is adapted to parts, gutta-percha or waxed-paper is laid over same, and covered with absorbent cotton. A suspensory bandage is next applied, and the parts elevated as much as possible. The result is often surprising. Change dressing twice daily.

In about three days the symptoms abate. The exudation in the Tunica vaginalis disappears rapidly.

The patient must have a daily movement of bowels and light diet, and in the beginning of treatment be confined to bed.

**The Cause of General Paresis.**—Evidence is slowly but surely accumulating each year proving that general paralysis of the insane is essentially a syphilitic disease. This is the commonly-accepted belief among alienists, although as yet without absolute demonstration. A few conservative investigators still hold that the case for etiology of general paresis is summed up in "syphilis and alcohol plus an unknown excitant," while the vast majority of alienists hold to the old Scandinavian idea, "No syphilis, no paresis."

Mott, of London, in a recent careful survey of juvenile general paresis, found practically all of the hundred or more cases to be dependent upon a syphilitic parentage. Hansen and Heiberg, in a very recent study of syphilis and general paresis in the psychiatric clinic of Kraepelin (*Revue Neurologique*, June 15, 1900), collected and compiled all statistics at hand in regard to the age at which syphilis and general paralysis are required. These data comprise 1000 syphilitic and 2200 general paretics. They found that the general-paralysis curve constructed from the data at hand showed the ages of thirty-five to forty years to be the most frequent period of the beginning of the disease, and the syphilitic curve was found to place the greatest number of patients in the age-period of twenty-two to thirty-two years; this makes practically twelve to thirteen years between the maximum of the two curves, which is the usually accepted period found to exist between the contraction of syphilis and the onset of general paralysis. If we can know to a certainty that these statistical ages can be vouched for in future, much may be done in the prevention of general paresis, a disease at present regarded as hopelessly incurable when once established.

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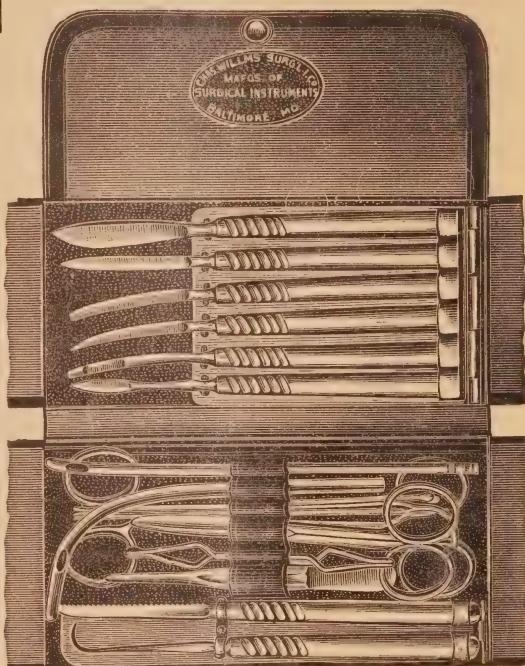
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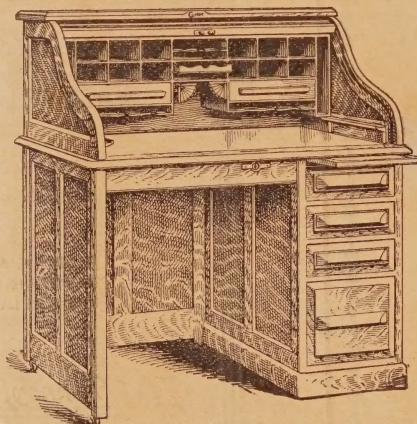
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